

IN THE CLAIMS

Kindly cancel Group II, claims 28-37 without prejudice.

1-14. (Cancelled)

15. (Previously Presented) A method comprising:

- using a magnetic field generator disposed on a substrate to generate an [[ac]]AC magnetic field,
- sensing with a magnetic sensor element also disposed on the substrate a magnetic property of at least one magnetic particle which magnetic property is related to the [[ac]]AC magnetic field, wherein a frequency of the [[ac]]AC magnetic field is at least 100 Hz.

16. (Previously Presented) [[A]] The method of claim 15, wherein the frequency has a value such that thermal white (Nyquist) noise of the magnetic sensor element is dominant over 1/f noise of the magnetic sensor element.

17. (Previously Presented) [[A]] The method of claim 15, wherein an amplifier is connected to the magnetic sensor element and the frequency of the [[ac]]AC magnetic field has a value such that thermal white noise at the output of the amplifier is dominant over 1/f noise at the output of the amplifier.

18. (Previously Presented) [[A]] The method of claim 15, wherein a direction of the generated [[ac]]AC magnetic field is mainly perpendicular to a plane of the magnetic sensor element in an immediate vicinity of the magnetic sensor element.

19. (Previously Presented) [[A]] The method of claim 15, further comprising:

- performing a calibrating measurement by employing the magnetic sensor element to measure a calibration value corresponding to the AC magnetic field generated by the magnetic field generator in an absence of magnetic particles;

- subtracting the calibration value from a measurement by the magnetic sensor element of the AC magnetic field generated by the magnetic field generator in the presence of the at least one magnetic particle.

20-23. (Canceled)

24. (Previously Presented) The method of claim 15, further comprising:

detecting a binding reaction of a target sample with a binding site disposed on the substrate, wherein the binding reaction brings the at least one magnetic particle into a vicinity of the magnetic sensor element and the magnetic sensor element detects the binding reaction by detecting the presence of the at least one magnetic particle.

25. (Previously Presented) The method of claim 24, wherein the target sample is one of a biological sample and a chemical sample.

26. (Previously Presented) The method of claim 15, wherein the substrate is a semiconductor substrate.

27. (Previously Presented) The method of claim 15, wherein the substrate is a glass substrate.

28-37. (Canceled)